REVISIONS			
LT	DESCRIPTION	DATE	APPROVED

Prepared in accordance with ASME Y14.100 Selected item drawing

REV STATUS OF PAGES																
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PMIC N/A	**PREPARED BY** Dennis L. Cross	**DEFENSE SUPPLY CENTER, COLUMBUS** **COLUMBUS, OH**
Original date of drawing 18 July 2002	**CHECKED BY** Andrew R. Ernst	**TITLE:** **RESISTOR, FIXED, FILM, PRECISION, CHIP 1/8 WATT, STYLE 2012**
	APPROVED BY Kendall A. cottongim	
	SIZE A / **CODE IDENT. NO.** 037Z3	**DWG NO.** 02001
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AMSC N/A 5905-E404

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

1. SCOPE

1.1 Scope. This drawing describes the requirements for a fixed, film, chip, .200 X .125, 1/8 watt, precision resistor.

1.2 Part or Identifying Number (PIN). The complete PIN is as follows:

02001-	1K050	T	C
Drawing number	Resistance (3.3.1 and 3.5)	Resistance tolerance (3.3.2)	Temperature characteristic (3.4)

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

DEPARTMENT OF DEFENSE

MIL-PRF-55342 -- Resistors, Fixed, Film, Chip, Nonestablished Reliability, Established Reliability, Space Level, General Specification For.

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-202 -- Tests Methods For Electronic and Electrical Components Parts.
MIL-STD-690 -- Failure Rate Sampling Plans and Procedures.
MIL-STD-790 -- Standard Practice for Established Reliability and High Reliability Qualified Products List (QPL) Systems for Electrical Electronic, and Fiber Optic Parts Specifications.
MIL-STD-1285 -- Marking of Electrical and Electronic Parts.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Document Automation and Production Service, Building 4D (DPM-DODSSP), 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following document forms a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN NATIONAL STANDARD INSTITUTE

ANSI/NCSL Z540-1 - Calibration Laboratories And Measuring And Test Equipment, General Requirements.

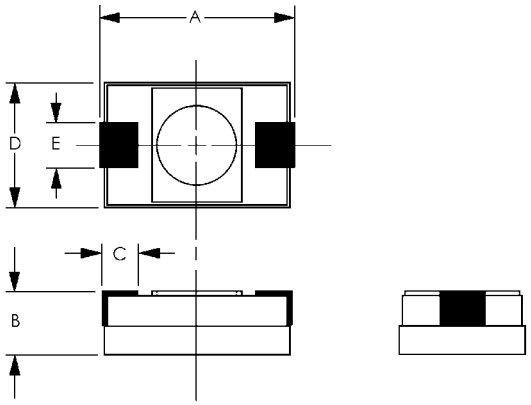
(Application for copies should be addressed to the American National Standard Institute, 11 West 42 Street, New York, NY 10036.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be as specified herein.

3.2 Interface and physical dimensions. The chip resistor shall meet the interface and physical dimensions as specified herein (see figure 1).



A	B	C	D	E
0.200 ±0.020	0.096 ±0.015	0.040 ±0.010	0.125 ±0.005	0.050 ±0.010

Inches	mm	Inches	mm
0.005	0.127	0.050	1.270
0.010	0.254	0.096	2.440
0.015	0.381	0.125	3.180
0.020	0.508	0.200	5.080
0.040	1.020		

Notes:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.

FIGURE 1. Resistor, fixed, film, precision, chip.

3.2.1 Design documentation. The design documentation shall be specified herein, and unless otherwise specified in the contract or purchase order, shall be retained by the manufacturer and available for review by the acquiring activity or contractor upon request.

3.3 Electrical characteristics.

3.3.1 Resistance. The nominal resistance is expressed in ohms and identified by five characters, consisting of four digits and a letter. The letter is used simultaneously as a decimal point and as a multiplier. For resistance values:

a. Greater than or equal to 10 ohms but less than 1 kilohm, the letter “R” is used to represent a decimal point.

b. Greater than or equal to 1 kilohm but less than 100 kilohms, the letter “K” is used to represent the decimal point.

All digits preceding and following the letters R and K of the group represent significant figures. Minimum and maximum resistance values shall be as specified herein (see 3.5). The standard values for every decade shall follow the sequence specified in table I for the resistance tolerances D and F. The resistance values for tolerances T, Q, A, and B maybe any value within the limits specified herein, but it is preferred that the values be chosen from the tighter tolerance columns of table I.

3.3.2 Resistors tolerance. Resistors are available in tolerances (T) ±.01 percent, (Q) ±.02 percent, (A) ±.05 percent, (B) ±.1 percent, (C) ±.25 percent, (D) ±.5 percent, and (F) ±1.0 percent.

3.4 Temperature characteristics. Resistors are available with temperature coefficient codes C or F as specified in table II.

TABLE I. Standard resistance values for the 10 to 100 decade.

Resistance tolerance											
T, Q, A, B, D	F	T, Q, A, B, D	F	T, Q, A, B, D	F	T, Q, A, B, D	F	T, Q, A, B, D	F	T, Q, A, B, D	F
10.0	10.0	14.7	14.7	21.5	21.5	31.6	31.6	46.4	46.4	68.1	68.1
10.1		14.9		21.8		32.0		47.0		69.0	
10.2	10.2	15.0	15.0	22.1	22.1	32.4	32.4	47.5	47.5	69.8	69.8
10.4		15.2		22.3		32.8		48.1		70.6	
10.5	10.5	15.4	15.4	22.6	22.6	33.2	33.2	48.7	48.7	71.5	71.5
10.6		15.6		22.9		33.6		49.3		72.3	
10.7	10.7	15.8	15.8	23.2	23.2	34.0	34.0	49.9	49.9	73.2	73.2
10.9		16.0		23.4		34.4		50.5		74.1	
11.0	11.0	16.2	16.2	23.7	23.7	34.8	34.8	51.1	51.1	75.0	75.0
11.1		16.4		24.0		35.2		51.7		75.9	
11.3	11.3	16.5	16.5	24.3	24.3	35.7	35.7	52.3	52.3	76.8	76.8
11.4		16.7		24.6		36.1		53.0		77.7	
11.5	11.5	16.9	16.9	24.9	24.9	36.5	36.5	53.6	53.6	78.7	78.7
11.7		17.2		25.2		37.0		54.2		79.6	
11.8	11.8	17.4	17.4	25.5	25.5	37.4	37.4	54.9	54.9	80.6	80.6
12.0	12.1	17.6		25.8		37.9		55.6		81.6	
12.1		17.8	17.8	26.1	26.1	38.3	38.3	56.2	56.2	82.5	82.5
12.3	12.4	18.0		26.4		38.8		56.9		83.5	
12.4		18.2	18.2	26.7	26.7	39.2	39.2	57.6	57.6	84.5	84.5
12.6		18.4		27.1		39.7		58.3		85.6	
12.7	12.7	18.7	18.7	27.4	27.4	40.2	40.2	59.0	59.0	86.6	86.6
12.9		18.9		27.7		40.7		59.7		87.6	
13.0	13.0	19.1	19.1	28.0	28.0	41.2	41.2	60.4	60.4	88.7	88.7
13.2		19.3		28.4		41.7		61.2		89.8	
13.3	13.3	19.6	19.6	28.7	28.7	42.2	42.2	61.9	61.9	90.9	90.9
13.5		19.8		29.1		42.7		62.6		92.0	
13.7	13.7	20.0	20.0	29.4	29.4	43.2	43.2	63.4	63.4	93.1	93.1
13.8		20.3		29.8		43.7		64.2		94.2	
14.0	14.0	20.5	20.5	30.1	30.1	44.2	44.2	64.9	64.9	95.3	95.3
14.2		20.8		30.5		44.8		65.7		96.5	
14.3	14.3	21.0	21.0	30.9	30.9	45.3	45.3	66.5	66.5	97.6	97.6
14.5		21.3		31.2		45.9		67.3		98.8	

TABLE II. Characteristic.

Resistance temperature characteristic (referenced to 25°C) (ppm/°C)								
RTC code	Temperature °C							
	-55		-15		+65		+125	
	Min	Max	Min	Max	Min	Max	Min	Max
C	-10	10	-10	10	-10	10	-10	10
F	-10	10	-5	5	-5	5	-10	10

3.5 Resistance range. The resistance range shall be from 10 ohms to 100 kohms.

3.6 Reactance. If circuit reactance is critical for your application, contact the sources of supply listed herein (see 6.5) for the circuit reactance characteristics.

3.7 Power rating. The power rating shall be 0.125 watt at +85°C. For operation at temperature in excess of +85°C, derate in accordance with figure 2.

3.8 Voltage rating. The maximum continuous working voltage shall not exceed 200 volts.

3.9 Maximum weight. The maximum weight shall not exceed 0.00221 pound (1 gram).

3.10 Termination finish. Termination material shall be in accordance with MIL-PRF-55342 code letter B, except the termination may consist of a solder coated, formed metal lead that egresses from the ends of the body and is formed around the bottom seating area of the device.

3.11 Power conditioning. When resistors are tested as specified in 4.6, there shall be no evidence of mechanical damage; the change in resistance shall not exceed ±(.05 percent +.001 ohm) for power conditioning, thermal shock, and overload test combined (see 3.12 and 3.13).

3.12 Thermal shock. When resistors are tested as specified in 4.7, there shall be no evidence of mechanical damage; the change in resistance shall not exceed ±(.05 percent +.001 ohm) for power conditioning, thermal shock, and overload tests combined (see 3.11 and 3.13).

3.13 Overload. When resistors are tested as specified in 4.8, there shall be no evidence of arching, burning, or charring; the change in resistance shall not exceed ±(.05 percent +.001 ohm) for power conditioning, thermal shock, and overload tests combined (see 3.11 and 3.12).

3.14 DC resistance. When resistors are tested as specified in 4.5, the dc resistance shall be within the specified tolerance of the nominal resistance (see 3.3.1) for all products deliverable on the contract.

3.15 Solderability. When resistors are tested as specified in MIL-PRF-55342 and 4.9, the immersed metallized surface shall be at least 95 percent covered with a new clean smooth coating.

3.16 Life. When resistors are tested as specified in 4.10, there shall be no evidence of mechanical damage. The change in resistance between the initial measurement and any of the succeeding measurements, up to and including 1,000 hours, shall not exceed ±.1 percent.

3.17 Resistance temperature characteristic. When resistors are tested as specified in 4.11, the resistance temperature characteristic, at each of the temperatures specified in table VI, referred to 25°C ±5°C, shall not exceed the value specified in table II for the applicable characteristic.

3.18 Dielectric withstanding voltage. When resistors are tested as specified in 4.12, there shall be no evidence of flashover, mechanical damage, arching, or insulation breakdown. The change in resistance shall not exceed ±(.05 percent +.001 ohm).

3.19 Insulation resistance. When resistors are tested as specified in 4.13, the insulation resistance shall be not less than 10,000 megohms.

3.20 Low temperature operation. When resistors are tested as specified in 4.14, there shall be no evidence of mechanical damage. The change in resistance shall not exceed ±(0.05 percent).

3.21 Solder mounting integrity. When resistors are tested as specified in MIL-PRF-55342 and 4.15 herein there shall be no evidence of mechanical damage.

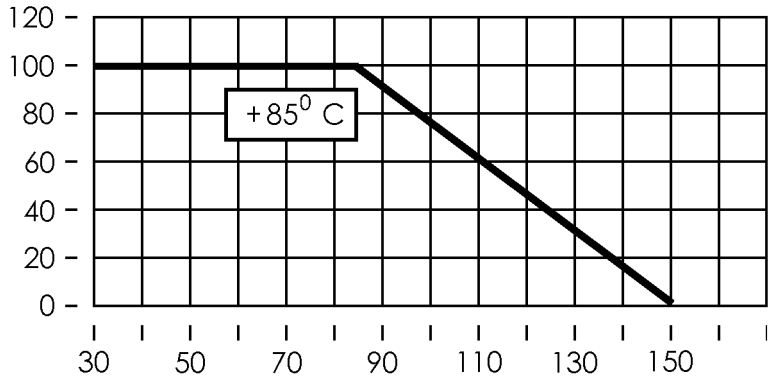
3.22 Resistance to bonding exposure. When resistors are tested as specified in 4.16, there shall be no evidence of mechanical damage. The change in resistance shall not exceed ±(.075 percent +.001 ohm).

3.23 Moisture resistance. When resistors are tested as specified in 4.17, there shall be no evidence of mechanical damage. The power applied shall be 0.1 watt not to exceed rated voltage as a load voltage on all samples. The change in resistance shall not exceed ±(.1 percent +.001 ohm).

3.24 High temperature exposure. When resistors are tested as specified in 4.18, there shall be no evidence of mechanical damage. The change in resistance shall not exceed ±(.2 percent +.001 ohm). Following this test, the dielectric withstanding voltage shall be as specified in 3.18, and the insulation resistance shall be 1,000 megohms minimum

3.25 Shock (specified pulse). When resistors are tested as specified in 4.19, there shall be no evidence of mechanical or electrical damage. The change in resistance shall not exceed ±(.01 percent +.001 ohm). There shall be no electrical discontinuity during the test.

3.26 Resistance to solvents. When resistors are tested as specified in 4.20, there shall be no evidence of mechanical damage and the markings shall remain legible.



NOTE: This curve indicates the percentage of nominal wattage to be applied at temperatures higher than 85°C for the same ΔR that would occur at 85°C during life testing. However, at no time shall the applied voltage exceed the maximum rated voltage.

FIGURE 2. Derating curves for various ambient temperatures.

3.27 Current noise. When resistors are tested as specified in 4.21, the current noise index shall not exceed –32dB from 10 ohms to 1 kohm, -15db from 1.01 kohms to 10 kohms, and 0db from 10.1 kohms to 100 kohms, unless otherwise specified.

3.28 Visual inspection. Resistors shall be inspected as specified in 4.22, to verify that the interface, physical dimensions, marking, and workmanship are in accordance with the applicable requirements (see 3.2 and 3.29).

3.29 Marking. Due to size limitations, this style resistor shall be marked with the following minimum information:

1K05: - First four characters of the resistance value code.
00TY: - Last two characters of resistance value code, tolerance, and temperature characteristic.

Each unit package shall be marked with the PIN assigned herein (see 1.2) and manufacturer's identification code (CAGE or logo). Where manufacturers are able to provide more information, the following is preferred in the sequence presented: Style, manufacturer's trademark, production lot code, and source code.

3.30 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.31 Certificate of compliance. A certificate of compliance shall be required from manufacturers requesting to be a suggested source of supply.

3.32 Workmanship. Resistors shall be uniform in quality and free from defects that will affect life, serviceability, or appearance.

4. VERIFICATION

4.1 Qualification inspection. Qualification inspection is not applicable to this document.

4.2 Reliability assurance program. The reliability assurance provisions specified in MIL-PRF-55342 and maintained in accordance with MIL-STD-790 are not applicable to this document.

4.3 Failure rate qualification. Failure rate qualification specified in MIL-PRF-55342 and MIL-STD-690 is not applicable to this document.

4.4 Conformance inspection.

4.4.1 Inspection of product for delivery. Inspection of product for delivery shall consist of group A and group B inspections:

4.4.1.1 Group A inspection. Group A inspection shall consist of the inspections specified in table III, and shall be made on the same set of sample units, in the order shown.

4.4.1.2 Subgroup I. Subgroup I tests shall be performed on 100 percent of the product supplied under this specification. Resistors that are out of resistance tolerance or which experience a change in resistance greater than that permitted for the tests of this subgroup shall be removed from the lot. Lots having more than 5 percent total rejects or one resistor, which ever is greater, due to exceeding the specified resistance change limit, shall not be furnished on the contract.

4.4.1.3 Subgroup II. A sample of 13 parts shall be randomly selected, if one or more defects are found, the lot shall be rescreened and defects removed. A new sample of 13 parts shall then be randomly selected. If one or more defects are found in this second sample, the lot shall be rejected and shall not be supplied against this document.

4.4.1.4 Subgroup III (solderability). A sample of 5 parts shall be randomly selected, as an option, the manufacturer may use electrical rejects from subgroup I test for all or part of the sample. If there are one or more defects, the lot is rejected. The manufacturer may use the following for corrective action:

a. Each lot that was used to form the failed lot shall be individually submitted to the solderability test. Lots that pass the solderability test are available for shipment.

b. The failed lot is submitted to a 100 percent hot solder dip. A subsequent solderability test shall then be performed. If the lot passes, it is available for shipment; if the lot fails, the manufacturer may perform the hot solder dip one additional time. If the lot fails, the lot is considered rejected and shall not be supplied to this drawing.

4.4.1.4.1 Disposition of samples. The solderability test is considered a destructive test and samples submitted to the solderability test shall not be supplied on the contract.

TABLE III. Group A inspection.

Inspection	Requirement paragraph	Test method paragraph	Number of samples
Subgroup I			
Power conditioning	3.11	4.6	
Thermal shock	3.12	4.7	100
Overload 1/	3.13	4.8	percent
DC resistance 2/	3.14	4.5	
Subgroup II			
Visual inspection	3.28	4.22	13
Subgroup III			
Solderability	3.15	4.9	5

1/ At the manufacturer's option, the determination of resistance change may be by any method which is within the accuracy requirements of this specification. The determination of resistance change shall be made upon completion of the overload test; the allowable change in resistance for the combined tests shall be specified (see 3.13).

2/ Resistors shall meet the specified initial resistance tolerance after being subjected to the preceding tests. The resistance measurement made upon completion of the overload test may be used if a measurement has been made which can, without conversion, be directly related to nominal resistance value and tolerance.

4.4.2 Group B inspection. Group B inspection shall consist of the inspections specified in table IV, in the order shown.

4.4.2.1 Certification. The acquiring activity, at its discretion, may accept a certificate of compliance with group B requirements in lieu of performing group B tests (see 6.2c).

4.4.2.2 Action in case of failure. If any of the subgroups fail Group B testing and an appropriate lot screen can be established the lot shall be screened and a new set of samples (see table IV for number of samples), from the screened lot, shall be submitted to the subgroup(s) that failed. If one or more defects are found in the resubmitted samples, the lot shall be rejected and shall not be supplied to this specification.

4.4.2.3 Disposition of sample units. Sample units which have been subjected to group B inspections shall not be supplied to this specification.

TABLE IV. Group B inspection.

Inspection	Requirement Paragraph	Test method paragraph	Number of sample units for inspection	Number of failures allowed
Subgroup I				
Life	3.16	4.10	5	0
Subgroup II				
Resistance temperature characteristic	3.17	4.11	5	0
Dielectric withstanding voltage	3.18	4.12		
Insulation resistance	3.19	4.13		
Low temperature operation	3.20	4.14		
Solder mounting integrity	3.21	4.15		
Subgroup III				
Resistance to bonding exposure	3.22	4.16	5	0
Moisture resistance	3.23	4.17		
Subgroup IV				
High temperature exposure	3.24	4.18	5	0
Shock (specified pulse)	3.25	4.19		
Subgroup V				
Resistance to solvents	3.26	4.20	5	0
Current noise	3.27	4.21		

4.5 DC resistance. (see 3.14). Resistors shall be tested in accordance with method 303 of MIL-STD-202. The following details and exceptions shall apply:

a. Measuring apparatus: Different types of measuring test equipment (multimeter, bridges, or equivalent) are permitted to be used on the initial and final readings of this test, provided the equipment is the same style, model, or if it can be shown that the performance of the equipment is equivalent. All test equipment shall be calibrated in accordance with ANSI/NCSL Z540-1.

b. Limit of error of measuring apparatus shall not exceed one-fourth of the resistor tolerance or the resistance change limit for which the measurement is being made. Manufacturers, at their option, may use the apparatus of less accuracy, provided limits are reduced to fully compensate for accuracy deviation.

c. Test voltage for bridges: Measurements of resistance shall be made by using the test voltages specified in table V. The test voltage chosen, whether maximum voltage or a lower voltage which would still provide the sensitivity required, shall be applied across the terminals of the resistor. This same voltage shall be used whenever a subsequent resistance measurement is made.

TABLE V. DC resistance test voltages.

Resistance, nominal	Maximum test voltage	
	0.5 watt or greater	Less than 0.5 watt
Ohms	Volts	Volts
10 to 98.8 inclusive	1	1
100 to 980 inclusive	3	3
1,000 to 9,800 inclusive	10	3
10,000 to 98,800 inclusive	30	10
0.1 megohm or higher	100	30

d. Measurement energy for electronic test equipment: The measurement energy applied to the unit under test shall not exceed 10 percent of the +25°C rated wattage times 1 second.

e. Temperature: The temperature at which subsequent and final resistance measurements are made in each test shall be within ±2°C of the temperature at which the initial resistance measurement was made.

4.6 Power conditioning (see 3.11). Resistors shall be tested in accordance with method 108 of MIL-STD-202. The following details and exceptions shall apply:

a. Test temperature and tolerance: 70°C +5°C, -0°C.

b. Initial measurements: Measurements may be made inside or outside the chamber.

(1) Inside chamber: When measurements are to be made inside the chamber, the initial dc resistance shall be measured, at the applicable test temperature, after temperature stabilization, and within 8 hours of exposure of the resistors to the test temperature. This initial measurement shall be used as the reference temperature for all subsequent measurements under the same condition.

(2) Outside chamber: When measurements are to be made outside the chamber, the initial dc resistance shall be measured at room temperature. This measurement shall be used as the reference temperature for all subsequent measurements under the same condition.

c. Operating condition: A dc voltage or filtered or nonfiltered full-wave rectified ac voltage shall be applied to the resistors intermittently, one and one-half hours on and one-half hour off, for 100 hours +4 hours and at the test temperature. During the "on" cycle, the voltage shall be regulated and controlled to maintain +5 percent of the required test voltage. Power applied shall be one and one-half times rated power not to exceed maximum voltage for the style.

d. Measurements after test: Following a minimum one-half hour stabilization period, dc resistance shall be measured as specified in 3.14.

e. Inspection after test: The resistors shall be inspected for evidence of mechanical damage.

4.7 Thermal shock (see 3.12). Resistors shall be tested in accordance with method 107 of MIL-STD-202. The following details and exceptions shall apply:

a. Mounting: Resistors may be mounted or unmounted. Resistors may be placed in metal baskets, vials, or other apparatus as long as resistors are subjected to the specified temperature extremes.

b. Measurement before cycling: DC resistance shall be measured as specified in 4.5.

c. Test condition F (except temperatures shall be +150°C, +10°C, -0°C and -65°C, +0°C, -10°C. These extreme temperatures shall be achieved within 4 minutes.

d. Measurement after cycling: After stabilization at room temperature, the dc resistance shall again be measured as specified in 4.5 and the resistors shall be examined for evidence of mechanical damage.

4.8 Overload (see 3.13). Resistors shall be tested as follows: Resistors may be mounted in any position and allotted any size space deemed necessary by the manufacturer. Forced air cooling may be used to maintain a test ambient temperature range of 20°C to 30°C. The average velocity of the forced air, if employed, shall not exceed 500 feet per minute.

4.8.1 Procedure. The load of 4.00 times the rated power for 5 seconds or 2 times the rated power for 10 minutes shall be applied as applicable. The maximum voltage applied shall be 500 V rms.

4.9 Solderability (see 3.15). Resistors shall be tested in accordance with method 208 of MIL-STD-202. Both leads shall be tested. Steam aging is not applicable.

4.10 Life (see 3.16). Resistors shall be tested in accordance with method 108 of MIL-STD-202. The following details and exceptions shall apply:

a. Method of mounting: Resistors shall be mounted per MIL-PRF-55342 on ceramic boards.

b. Test temperature: 85°C ±5°C.

c. Initial measurements: Measurements may be made inside or outside the chamber.

(1) Inside chamber: When measurements are made inside the chamber, the initial dc resistance shall be measured after mounting at the applicable test temperature, after temperature stabilization, and within 8 hours of exposure of the resistors to the test temperature. This initial measurement shall be used as the reference temperature for all subsequent measurements under the same condition.

(2) Outside chamber: When measurements are made outside the chamber, the initial dc resistance shall be measured after mounting at the room temperature. This initial measurement shall be used as the reference temperature for all subsequent measurements under the same condition.

d. Operating conditions: Rated dc continuous working voltage, or filtered or nonfiltered full wave rectified ac voltage, shall be applied intermittently, 1.5 hours on and 0.5 hour off, for the applicable number of hours (see 4.10f), and at the applicable test temperature. "On time" shall be three quarters of the total elapsed time. During the "on" cycle, the voltage shall be regulated and controlled to maintain ±5 percent of the rated continuous working voltage.

e. Test condition: One thousand hours elapsed time for inspection with all samples.

f. Measurements during test:

(1) DC resistance shall be measured at the end of the 30 minutes off periods after 250 hours +72 hours, -24 hours; 500 hours +72 hours, -24 hours; and 1,000 hours +96 hours, -24 hours elapsed.

(2) Measurements outside of the chamber: When measurements are made outside the chamber, resistors shall be outside of the chamber for a minimum of 45 minutes and stabilized before measurement.

g. Examination after test: Resistors shall be examined for evidence of mechanical damage.

4.11 Resistance temperature characteristic (see 3.17). Resistors shall be tested in accordance with method 304 of MIL-STD-202. The following details and exceptions shall apply:

a. Resistors shall be mounted per MIL-PRF-55342 using ceramic boards.

b. Referenced temperature: Room ambient temperature.

c. Test temperature: In accordance with table VI.

d. Stability of temperature: Resistors shall be maintained for 30 minutes to 45 minutes within 1°C at each of the test temperatures in table VI. This tolerance shall be maintained at the established test temperatures. Allow resistor to stabilize at the temperature in table VI for a minimum of 5 minutes.

e. The resistance temperature coefficient will be based on the stabilized temperature.

TABLE VI. Resistance temperature characteristic.

Sequence 1/	Temperature
	Group B acceptance inspection
	°C
1	25 ±3 2/
2	-55 ±3
3	25 ±3 2/
4	+125 ±3

1/ At the option of the manufacturer, the reverse sequence of table VI may be as follows:

1. 25 ±3
2. +125 ±3
3. +25 ±3
4. -55 ±3

2/ Reference temperature for each of the succeeding temperatures.

4.12 Dielectric withstanding voltage (see 3.18).

4.12.1 Atmospheric pressure. Resistors shall be tested in accordance with method 301 of MIL-STD-202. The following details and exceptions shall apply:

a. Special preparations. Resistors shall be placed in fixtures that short the terminations on the termination side of the resistor together and a second conductive surface that contacts the flat top surface of the resistor (see figure 3).

b. Initial measurement: DC resistance shall be measured as specified in 4.5.

c. Magnitude of test potential: Sine wave test potential of magnitude shall be 450 volts.

d. Nature of potential: An ac supply at commercial-line frequency (not more than 100 Hz) and waveform.

e. Rate of application of test voltage: One hundred volts per second.

f. Duration of application of test voltage: One minute.

g. Points of application of test voltage: Between the resistor terminals connected together and the second conductive surface.

h. Measurement after test: DC resistance shall be measured as specified in 4.5.

i. Examination after test: Resistors shall be examined for evidence of flashover, mechanical damage, arching, and insulation breakdown.

4.12.2 Barometric pressure (reduced). Resistors shall be tested in accordance with method 105 of MIL-STD-202. The following details and exception shall apply:

a. Method of mounting: As specified in 4.12.1a.

b. Initial measurement: DC resistance shall be measured as specified in 4.5.

c. Test condition D (100,000 feet).

d. Magnitude of test voltage: Sine wave test potential of magnitude shall be 200 volts.

e. Nature of potential: As specified in 4.12.1d.

f. Rate of application of test voltage: One hundred volts per second.

g. Duration of test: One minute.

h. Points of application of test voltage: As specified in 4.12.1g.

i. Final measurement: DC resistance shall be measured as specified in 4.5.

j. Examination after test: As specified in 4.12.1i.

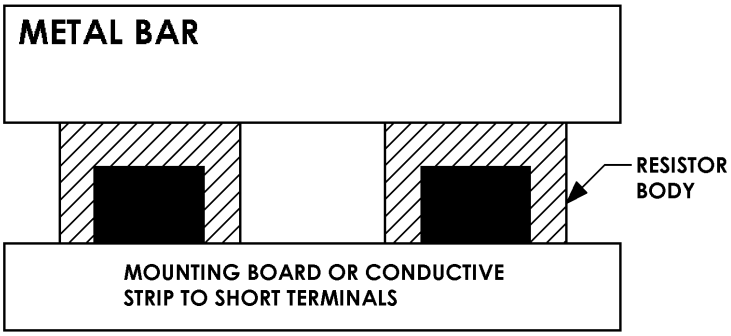


FIGURE 3. Mounting for dielectric withstanding voltage and insulation resistance tests.

4.13 Insulation resistance (see 3.19). Resistors shall be tested in accordance with method 302 of MIL-STD-202. The following details and exceptions shall apply:

a. Test condition B (500 volts).

b. Special preparations: As specified in 4.12.1a.

c. Points of application: As specified in 4.12.1g.

4.14 Low temperature operation (see 3.20). Following a dc resistance measurement as specified in 4.5, the resistors shall be placed in a cold chamber at -65°C +0°C, -5° C. After 1 hour of stabilization at this temperature, full rated continuous working voltage as specified in 3.8 shall be applied fro 45 minutes. The resistors may be loaded individually or in parallel. Fifteen +5, -0 minutes after the removal of the voltage, the temperature in the chamber shall be gradually increased to room temperature within a period of not more than 8 hours. The resistors shall be removed from the chamber and maintained at a temperature of 25°C ±5°C for a period of approximately 24 hours; the dc resistance shall then be measured as specified in 4.5. Resistors shall then be inspected for evidence of mechanical damage.

4.15 Solder mounting integrity (see 3.21). Resistors shall be tested in accordance with MIL-PRF-55342, mounting integrity, termination B. The force applied shall be 3 kilograms.

4.16 Resistance to bonding exposure (see 3.22). Resistors shall be tested in accordance with MIL-PRF-55342.

4.17 Moisture resistance (see 3.23). Resistors shall be tested in accordance with MIL-PRF-55342.

4.18 High temperature exposure (see 3.24). Resistors shall be tested in accordance with MIL-PRF-55342.

4.19 Shock, specified pulse (see 3.25). Resistors shall be tested in accordance with method 213 of MIL-STD-202. The following details and exceptions shall apply:

a. Mounting: The resistor shall be mounted with the body clamped or cemented to a flat surface. The resistors shall be mounted to insure that they have the same motion as the shock table. In all cases, the resistors shall be mounted in relation to test equipment so that the stress applied is in the direction that would be considered most detrimental.

b. Measurement before shock: DC resistance shall be measured as specified in 4.5.

c. Number and direction of applied shock: The resistors shall be subjected to a total of 10 shocks in each of three mutually perpendicular planes, two perpendicular and the other parallel to the longitudinal axis of the resistor.

d. Test condition I (100 g's, 6 milliseconds (ms) sawtooth).

e. Measurement during shock: Each resistor shall be monitored to determine electrical discontinuity by a method that shall at least be sensitive enough to monitor or register, automatically, any electrical discontinuity of 0.1 ms or greater.

f. Measurement after shock: DC resistance shall be measured as specified in 4.5.

g. Examination after test: Resistors shall be examined for evidence of mechanical and electrical damage.

4.20 Resistance to solvents (see 3.26). Resistors shall be tested in accordance with method 215 of MIL-STD-202. The following details shall apply:

a. Mounting: Unmounted.

b. The marked portion of the resistor shall be brushed.

c. The number of sample units shall be as specified in table IV.

d. Resistor shall be examined for mechanical damage and legibility of minimum marking.

4.21 Current noise (see 3.27). Current noise shall be measured in accordance with method 308 of MIL-STD-202.

4.22 Visual inspection (see 3.28). Resistors shall be examined under 30X to 60X magnification. In case of conflict 30X will be the referee power to verify that the requirements of 3.28 are met.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature which may be helpful, but is not mandatory.)

6.1 Intended use. The film resistors described herein are intended to be used where high precision and stability are required.

6.2 Ordering data. The contract or purchase order should specify the following:

a. Complete PIN (see 1.2).

b. Requirements for delivery and one copy of the conformance inspection data or certification of compliance that parts have passed conformance inspection with each shipment of parts by the manufacturer.

c. Whether the manufacturer performs the group B tests or provides certification of compliance with group B requirements.

d. Requirements for packaging and packing.

e. Circuit reactance requirements.

6.3 Electrostatic charge. Under several combinations of conditions, these resistors can be electrically damaged, by electrostatic charges, and drift from specified value. Users should consider this phenomena when ordering or shipping resistors. Direct shipment to the Government is controlled by MIL-DTL-39032. which specifies a preventive packaging procedure.

6.4 Users of record. Coordination of this document for future revisions are coordinated only with the suggested sources of supply and the users of record of this document. Requests to be added as a recorded user of this drawing should be in writing to: DSCC-VAT, P.O. Box 3990, Columbus, OH 43216-5000 or by telephone (614) 692-0553 or DSN 850-0553.

6.5 Suggested source of supply. A suggested source of supply is listed herein. Additional sources will be added as they become available. For assistance in the use of this drawing contact: DSCC-VAT, P.O. Box 3990, Columbus, OH 43216-5000 or by telephone (614) 692-0553 or DSN 850-0553.

DSCC drawing PIN	Vendors similar designation or type number 1/	Vendor CAGE	Vendor name and address
02001-*******	PTF2012	91637	Vishay Dale Electronics, Inc. P.O. Box 609 Columbus, NE 68602-0609

1/ Parts must be purchased to this DSCC PIN to assure that all performance requirements and tests are met.